MEASUREMENTS FOR OPERATING DISTANCES IN THE NOSE.

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I HAVE measured sixty-four half heads representing at least fifty whole heads in order to get an idea of the operating distances in the nose. The measurements were made on wet specimens. The central figures in large type are the measurements which occurred the greater number of times, not the mathematical average. The figures in small type, before and after the central figures, are the maximum and the least measurements. Certain of these measurements have been duplicated by others. As their measurements were made from the middle of the nasal opening, they are greater than mine. My measurements were made from the lower edge of the posterior rim of the nasal opening (Fig. 1). All vertical measure-

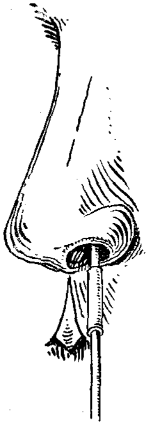

FIG. 1.—Drawing to show the point from which measurements were taken.

ments were made close to the junction of the septum and the cribriform plate. If measurements are not made in this way, the probe enters the lateral mass of the ethmoid, where it mounds up above the cribriform plate and the measurements are increased one-eighth to one-quarter of an inch. Since most of us visualize inches and fractions of inches more readily, the measurements are given in these.

In the measurement from the upper end of the infundibulum horizontally forward to the root of the nose, the upper of the two central figures is the average distance,. but, owing to the slope of the posterior wall of the frontal sinus forward, the working distance is much smaller. The lower of the two central figures is the average working distance. The smallest working distance which I found in this place was one-fourth of an inch; the greatest, one-half of an inch.

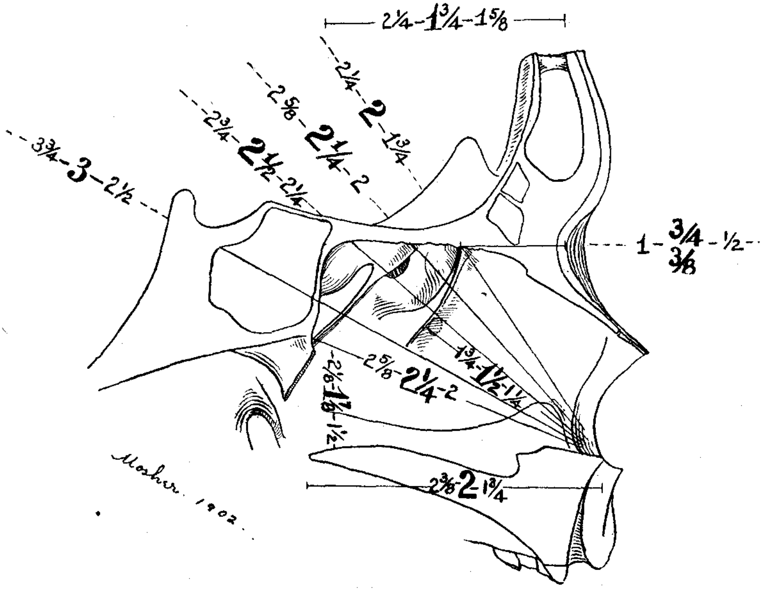

FIG. 2.—Operating distances obtained from the measurement of sixty-four half heads. The lachrymal duct is not given on this diagram. The average distance is one inch.

In order to find the relation between the measurements made on the cleaned skull and those made on the wet specimen, I measured fifty-six skulls. In these the average measurement to the cribriform plate at the upper end of the infundibulum was one and seven-eighths inches. The maximum and the minimum measurements were two and one-eighth and one and one-half inches. The average measurement to the anterior wall of the sphenoidal sinus was two and one-eighth inches.

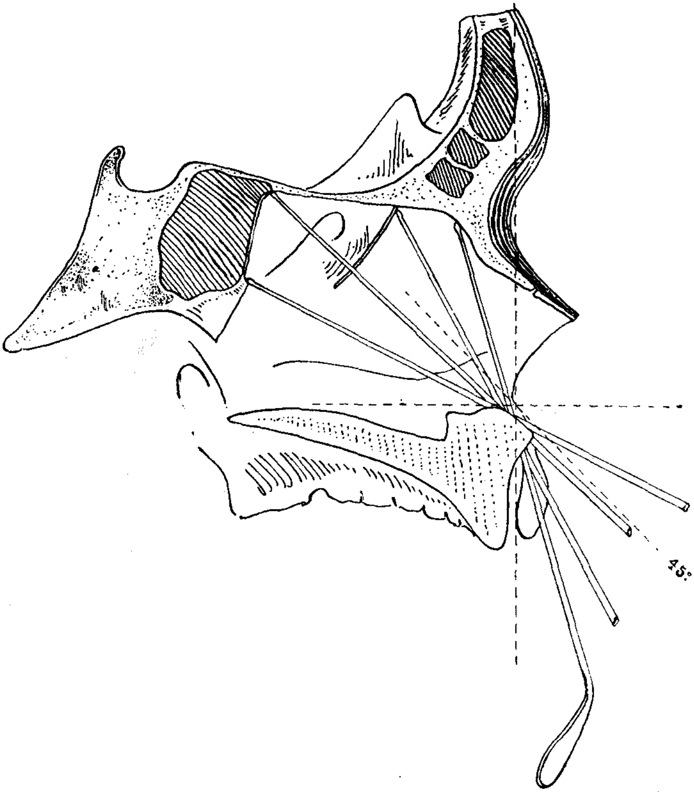

FIG. 3.—Drawing showing the angles at which a probe must be introduced in order to touch the various points of the nose.

The maximum and minimum, two and nine-sixteenths and one and seven-eighths inches. This shows that in wet specimens and in the living, one-eighth to one-quarter of an inch has to be added to the measurements made on the cleaned skull.

These measurements on the cleaned skull were made from the lower edge of the nasal notch, taking the deeper of the two openings when they were not alike. This is fairly common. However, in the rather coarse measurements which are possible in life, this occasional difference between the two sides can be disregarded.

My material offered but little opportunity to try for a ratio between the different measurements and any of the diameters of the skull. I experimented a little with the anterior posterior diameter, but nothing came of it. Grunwald tried for something of the same sort, but established nothing. Personally, I feel that heads vary so much that it is rather improbable that any ratio of practical importance will be found. At present, all that can be done is to expect large measurements in large heads, and the reverse in small heads. I found, however, that the smallest measurements occurred in heads with toothless jaws.

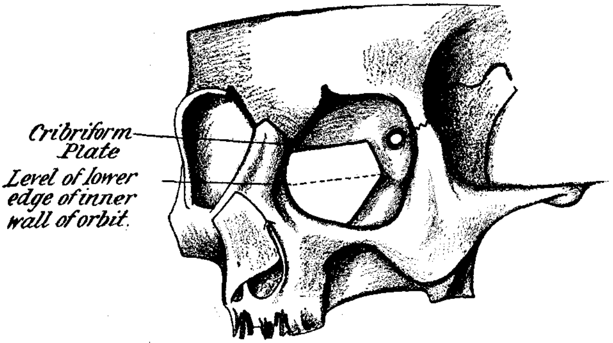

FIG. 4.—Drawing showing the level of the cribriform plate. The inner wall of the orbit and a part of the floor have been taken away.

The results of these measurements are given in Fig. 2. The position of the lachrymal duct is not given in this figure. The lower opening of the duct is placed under the anterior end of the inferior turbinate about two-thirds of the way to the opening of the antrum. This would make the average distance one inch.

In making the measurements of the floor of the frontal sinus, I was struck with the fact that if a burr is entered at the upper end of the infundibulum and passed directly upward in order to open the frontal sinus, it will in the majority of cases enter the cranial cavity. This is due to the frequent sharp slope forward of the posterior wall of the sinus. In order to enter the sinus from this point, the burr should point forward at an angle of 45 degrees, and would have a working distance of half an inch. In order to bore straight up into the sinus, the probe must be held parallel with the teeth and close to them.

The direction in which the probe must be pointed in order to touch the various parts of the nose is shown in Fig. 3. From this diagram, which is taken from a tracing of a probe in these different positions, it will be seen that in order to touch the sphenoid bone the probe must be at an angle of 45 degrees, or between this and an angle of 67.5 degrees.

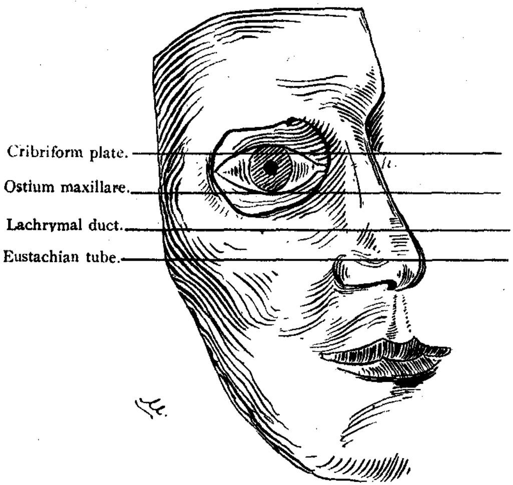

FIG. 5.—Drawing to show the horizontal planes of the cribriform plate, the ostium maxillare, the lachrymal duct, and the Eustachian tube.

There is one other point in the applied anatomy of the nose which I looked up, and that is the level on the face of certain of the internal landmarks of the nose. I found in a majority of my specimens that a line passed one-quarter of an inch above the lower rim of the orbit and carried horizontally backward passed through ostium maxillare; a line one-quarter of an inch below the rim cut the lower opening of the lachrymal duct; a line one-half of an inch below the rim passed through the upper border of the opening of the Eustachian tube. Fifty cleaned skulls gave the level of the cribriform plate as the mid-point of the inner wall of the orbit, and wet specimens showed that this point is one-eighth of an inch above the inner canthus of the eye.

These levels, of course, are not absolute. The opening of the antrum may be on a level with the lower rim of the orbit, not one-quarter of an inch above it. In the same way the opening of the lachrymal and the Eustachian tube may move up; but the level of the cribriform plate—and this is the important one—I found to be rather constant.

I recognize fully, I think, the variability of these measurements, and that their total number is small. In spite of this, they furnish a certain amount of help, and so they are put out.